magnaplast

ULTRA dB INDOOR LOW NOISE SEWAGE SYSTEM

CATALOGUE • INSTRUCTION

95°C TEMPERATURE RESISTANCE

dB SOUND INTENSITY

100% RECYCLING

Among wide product range of indoor sewage systems offered in the marketplace the low-noise Ultra dB products are characterized by exceptional features:

- *maximum noise level 16 dB,*

- *pipes with multilayer structure and solid wall made of polypropylene with mineral components added,*

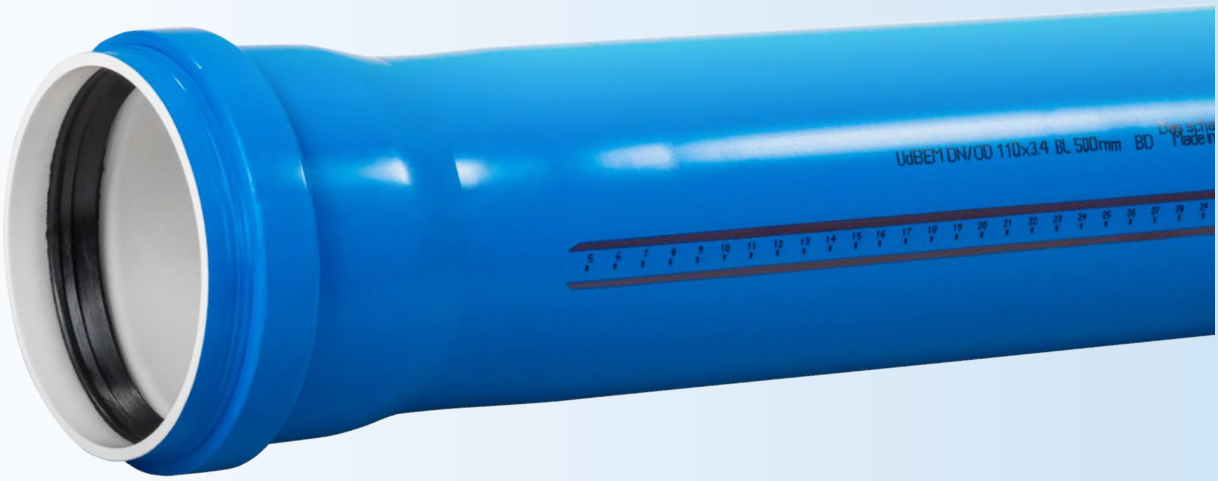
- *high resistance to sewage activity at maximum temperature of 95°C,*

- *very high resistance of the overall system to aggressive sewage with ph value ranging from 2 to 12,*

- *an option of mounting indoor and under the building (in soil) - BD area.*

Table of content:

Ultra dB system



The Ultra dB low noise indoor sewage system is a complete system of pipes and fittings made of polypropylene (PP) with mineral components added, compliant with the requirements set forth in the Technical Approval No. AT-15-9406/2014, issued by the Polish Building Research Institute (ITB). The pipes are characterized by structural walls: internal wall – in white color, an external wall – blue, smooth, dirt resistant, with permanent overprint of centimeter scale. The smooth internal surface in white color facilitates inspection.

The pipes are co-extruded, creating solid layer with molecular bindings. The fittings are made using injection method. The application of polypropylene and special wall design make the system compliant with the requirements set forth for modern sewage system: **safe, indestructible, lasts for years!**

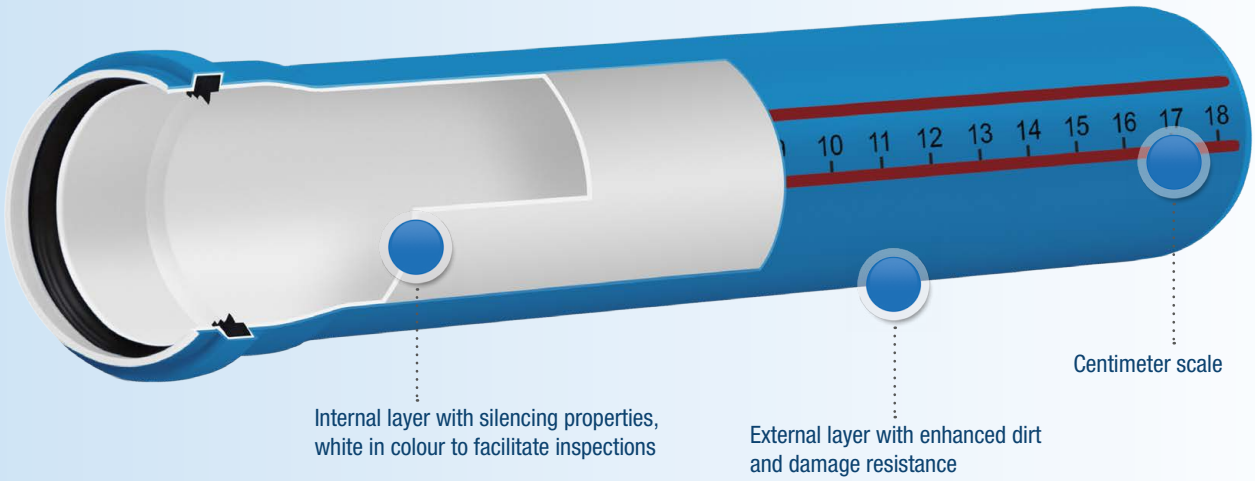
Excellent material properties: high impact resistance, resistance to chemical compounds and high temperature, excellent tightness, small weight, easy installation are the reasons why products made of polypropylene and mineral additives are highly popular in the marketplace, and their share compared to conventional PP or PVC-U solutions is growing very dynamically.

The Ultra dB system is made with the following diameters 50, 75, 110 mm. The material composition and wall thickness offer very high degree of sound insulation - noise level of 16 dB. To joints lip seals are applied. They are made of rubber-based compound.

Pipes are light and consequently their mounting is easy. Smooth inner surface of the pipe is characterized by minimum resistance for flowing sewage, which even with very low slope of the sewage system, eliminates deposit buildup; by the same token there is no sewage putrescibility in pipes, and also no congestion occurs.

System benefits

• high level of sound insulation, thanks to structural walls of pipes made of polypropylene (PP) with natural additives, noise level of 16 dB, confirmed by the tests carried out by Fraunhofer Institute at Stuttgart, in accordance with DIN 4109-10 standard, 3rd class of sound insulation is met for buildings with permanent stay of people,
• resistance to aggressive sewage with the values ranging from 2 pH to 12 pH,
• high thermal resistance to maximum sewage temperature 90°C with permanent flow, with peak temperature 95°C achieved for the short-term flow,
• high mechanical resistance at temperatures even down to -10°C - consequently you may mount pipeline in winter conditions,
• easy and effective assembly of the systems thanks to the application of overprint of centimeter scale on pipes; the pipes may be cut into sections of any length and very simple methods of joining without special tools, thanks to lip seal installed at the factory and wide range of fittings,
• very good hydraulics of sewage flow thanks to safeguarding perfectly smooth inner surface of pipe, preventing deposit buildup,
• very high resistance of pipes to compression and impact as well as suitability for mounting indoors and underneath the structure in soil or in concrete, thanks to ring stiffness minimum 4 kN/m2 (scope of BD application - classs S16),
• 100 % recovery rate of raw materials used for production thanks to recyclability of pipes and fittings covered by the Ultra dB system



Application

The Ultra dB low-noise indoor sewage system is used for construction of non-pressure, low-noise sanitary systems, storm water and industrial drainage. The sewage system is used for discharge of highly aggressive domestic, municipal sewage and industrial effluents (with ph value from 2 to 12), including high concentrations of hydrogen sulfide, and is also characterized by resistance to high temperature.

The Ultra dB system, due to offered benefits, is widely applied not only in single- and multi-family housing, but is also used for construction of systems for the purposes of: apartment buildings, nursing homes, office premises, studies and offices, hotels, restaurants, hospitals, operating theatres, spas, laboratories, dentist's surgeries, schools, lecture rooms at universities, reading rooms, radio and TV studios, concert halls and conference rooms, theatres, shop floors and to discharge effluents, among others, from pharmaceutical, food and catering industries (when effluent with high fat content is transported then pipes are recommended to be heated up to 70°C).

Noise protection

Given the current level of construction market development the noise from installation systems has major impact on building acoustics. The expectations of users are growing, whereas the required noise level reductions in buildings will undoubtedly become stricter. The issues related to building acoustics including the permissible indoor levels of noise from building technical equipment are covered by the standard PN-B-02151-02:1987. The fulfilment of obligation to provide building acoustic protection, with the application of Ultra dB system – introduced by the recommendation of the EC Directive89/106/EEC and interpretation for this Directive, is confirmed by the results of acoustics expert opinion prepared by the Fraunhofer Institute **where weighted material sound level is LSC,A dB(A) = 16 dB.**

The noise from low noise system made of Ultra dB pipes was measured using the methodology prepared by the scientists from the IBP Fraunhofer Institute from Stuttgart and specified in the standard EN 14366. Diagram of measuring system - Fig. No. 1. Pursuant to EN 14366 standard the test applies to the vertical system in a three storey building, located next to the wall with basis weight of 220 kg/m2. At each storey there is a tee-pipe, blinded at the other two storeys. The vertical section below the lowest storey continues further as a horizontal section by the application of two 45° elbows and compensatory section. The floor culverts are made hermetically. Water – test medium is injected into the measuring system at the highest storey, and collected at the horizontal section at the lowest level. Noise is measured at the lowest storey at the following flow rates: 0.5; 1.0; 2.0 and 4.0 l/s.

The adopted least advantageous boundary conditions are as follows:
- most common maximum flow rate: 4.0 l/s,
- the diameter of the most common rising pipe is DN 110 mm,
- measuring place: located the lowest room, behind the wall to which riser pipe is fixed.

Measured quantity	Ultra dB system 110 x 3.4 with clamping rings type „BISMAT 1000”			
Flow rate, l/s	0,5	1,0	2,0	4,0
Measured index of airborne sound level, $L_{a.A}$, dB(A)[1/]	44	48	52	54
Measured index of material sound L_{SC},A, dB(A)[1/]	<10	<10	13	16

[1/] measured acc. to PN-EN 14366:2006, in the room located at ground floor behind the wall to which rising pipe is fixed

Fig. No. 1 – Acoustic characteristics

The tests showed that the system Ultra dB is characterized by high level of sound insulation and reaches the noise level at 16 dB Fig. No. 1. Fatigue felt by the man's nervous system appears at the level of 30 dB. The Ultra dB system, with noise transported by air and solid bodies, operates very quietly. The system meets also rigorous recommendations of DIN 4109 standard and very rigorous recommendations of VDI 4100 standard (max. 20 dB semi-detached and terraced houses).

The Ultra dB system is a universal solution. It should be applied in each type of housing, hotels, schools and industry, because it guarantees silence, comfort and durability in long-term perspective. The average noise levels in our environment are presented in Fig. No. 2.

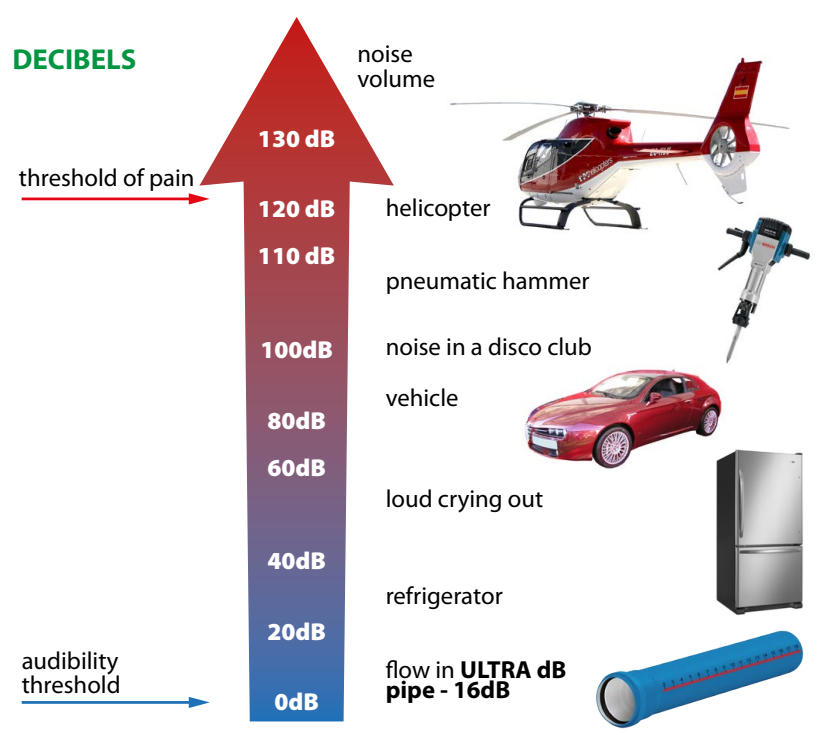


Fig. No. 2 - Illustrative noise sources

Bearing in mind maximum use of Ultra dB system benefits, high sound insulation, it is recommended to install sewage system following the principles presented below:
- pipelines have to be laid next to the external walls or next to the walls with basis weight ≥220 kg/m2,
- any culverts through the walls and floors have to be made with the application of materials suppressing noise e.g. polyurethane foam,
- apply fixing elements (clamping rings) equipped with rubber inserts,
- avoid mounting system next to the walls requiring sound suppressing insulation,

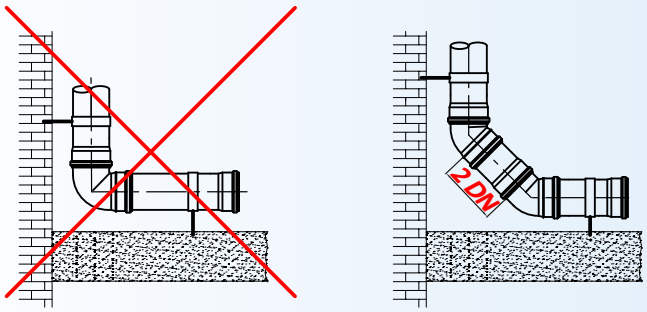
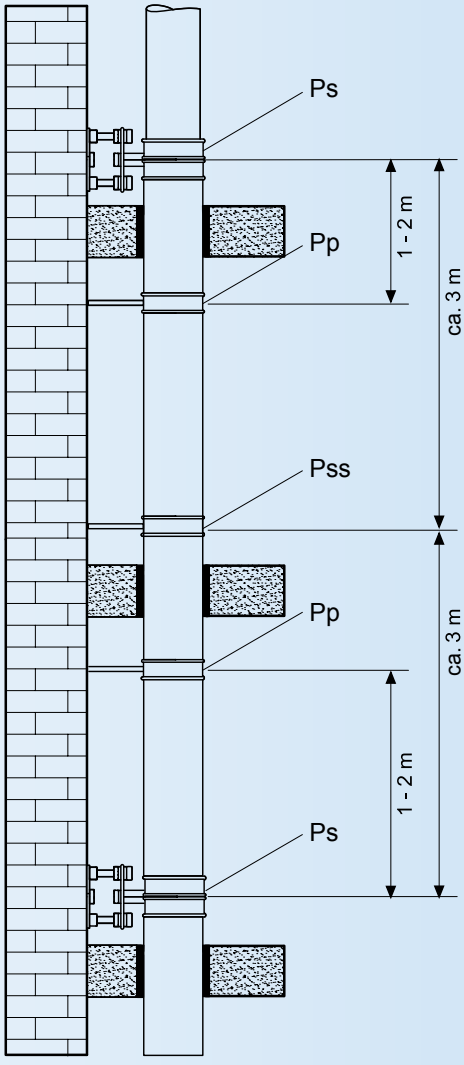


Fig. No. 3 Change of riser pipe direction

- the transition of riser pipe to horizontal section or changing direction shall be made using 2 bends, maximum 45°, and between them apply stabilization section with the length of 2 x DN (with the riser pipe heights exceeding 10 m it's necessary) - Fig. No. 3,

- assembly of pipe installation using special clamping rings BISMAT 1000 perform taking into account proper distances - Fig. No. 4.; clamping rings BISMAT 1000 install as fixed points at min. every second floor; installation of other fixed points and sliding points can be performed using standard clamps with rubber insert



Ps - fixed point – clamping rings BISMAT 1000.
Pp - sliding point – standard clamping ring with rubber insert.
Pss - fixed point – standard clamping ring with rubber insert.

Fig. No. 4 Fixing of riser pipes

Storage

Depending on their length the Ultra dB pipes are bundled and placed on pallets or in cardboard boxes. The pallets are stored horizontally on even substrate and cleaned of stones and sharp objects, preferably in original producer's packaging. To avoid deformations, the pipes should rest alongside their overall length. The pipes shall be laid in layers interchangeably so that sockets could rest freely. The Ultra dB system pipes and fittings can be stored at open-air storages. The tests have shown that even several year long exposure to the UV radiation has no negative impact on properties of pipes and their durability, however, due to aesthetic reasons it is recommended to protect them against fading. For this purpose canvas cover or black foil can be used.

The pipes are marked as follows:

- system name,
- diameter,
- material,
- product identification (symbol, angle, length),
- year of manufacture
- bar code,
- centimeter scale.

Pipe diameter	Pipe length	Quantity of pipes per pallet
50	250	480
50	500	320
50	1000	200
50	2000	200
75	250	320
75	500	160
75	1000	120
75	2000	120
110	250	120
110	500	80
110	1000	80
110	2000	80

System installation

The Ultra dB system pipes are connected by means of sockets and fittings where the producer has installed a lip seal made of rubber compound. The lip seal applied in the socket has a special shape, which facilitates the withdrawal of the bare pipe end.

To perform correct connection it is necessary to clean ends of pipes, fittings and sealing components to be connected; then the pipe ends have to be smeared with a lubricant agent, the position of elastomer seal has to be checked, pipe has to be inserted into the socket to the stop – if a pipe is connected with the fitting, the pipe has to be withdrawn from the socket by 1.0 cm – in case of connecting pipe with a pipe (Fig. No. 5) the Ultra dB sewage pipes have to be fixed in such manner that no stress occurs and to allow for compensation of thermal elongation (it is assumed that one socket joint with a seal compensates elongation by 1.0 cm); in order to maintain compensation gap the assembled riser pipes have to be fixed with clamping rings and holders.

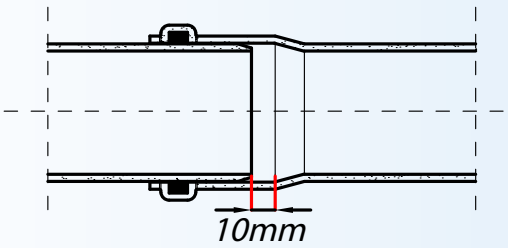


Fig. No. 5 Pulling out of pipe from the socket

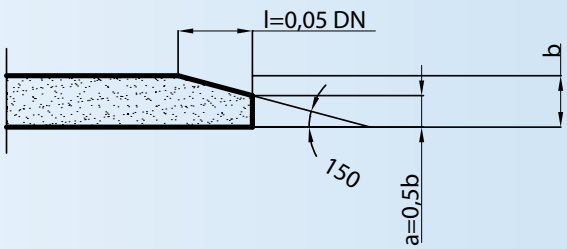


Fig. No. 6 Bevelling of pipe

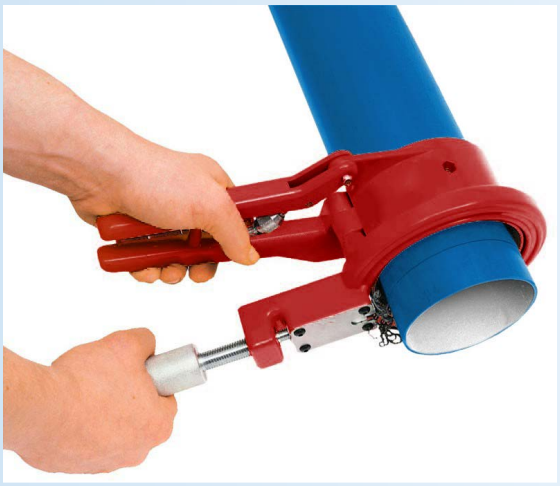
The pipes have to be laid with sockets facing the opposite direction to the sewage flow. The Ultra dB system can be freely connected using appropriate fittings with the pipes of KG outdoor sewage system, and with inspection chamber (SC) system, offered by MAGNAPLAST.

Usually riser pipes are fixed to the wall structure, under the socket. The riser pipe made of the Ultra dB system pipes, connected through sockets, shall have two fixing points at each storey. For pipe fixing the following has to be applied:

- as fixed points - widely available in the marked clamping rings with rubber suppressing pad under the ceiling (under the socket)
- as sliding points - clamping rings with rubber suppressing pad - half way through the storey height.

The Ultra dB pipes and fittings can be mounted directly in the concrete or in the masonry wall. To prevent the migration of concrete to the sleeve, it has to be made hermetic with a tape. The system components have to be fixed so that during concrete laying there is no pipeline displacement. The floor culverts have to be made hermetic and in the manner safeguarding sound insulation. When mastic asphalt is used on the floor, the system components in the floor culvert area have to be protected with protective pipes or through wrapping them with thermal insulation material.

The existing system can be expanded by mounting a tee pipe using sliding muffs. At the place of expansion you have to cut out a straight pipe section with appropriate length (L = fitting length + 2.5 DN) and mount the tee pipe. The place of contact has to cleaned and smoothed. The remaining socket-free pipe section and the piece of pipe corresponding with the gap length, have to be covered with a sleeve each. Then mount this piece of pipe in the system and slide sleeves through cut edges.



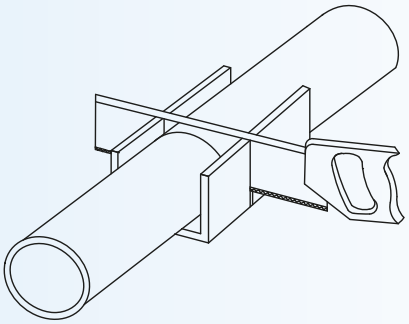


Fig. No. 7 Cutting of pipes

Pipes are cut to the size by means of appropriate knife for plastics, alternatively using fine teeth saw, manual or mechanical - Fig. No. 7. Pipe cutting has to be performed perpendicularly to the pipe axis. Miter boxes or pipe wrapping with a paper sheet could be helpful. After cutting remove the burrs from cut edge. The pipe end has to be cut diagonally using cutting tool or file with thick cuts at an angle of approx. 15°. (Fig. No. 6).

System mounting in the soil

To take full advantage of Ultra dB system pipes' benefits through their laying in soil it is necessary to provide for appropriate conditions for their laying, back filling, soil compaction and meeting the requirements of PN-ENV 1046: 2007 standard. The bedding layer has to be made depending on soil type:

- 10 cm thick bedding layer with the max. grain size Ø22 mm for pipes with maximum diameter (DN) of 200 for dry soils,
- 15 cm thick bedding layer with grain size as above, for soil with high groundwater level – earthworks shall be carried out using drained excavations,
- 25 cm thick bedding layer in rocky soils or with grain size exceeding Ø 40 mm.

The bedding layer has to be made using loose soil, single or multifraction material, coarse-grained sand with small content of fine particles, all-in aggregate or crushed aggregate, with grain size from 2mm to 40 mm. The bedding layer shall be compacted thoroughly (min. 85% of Procter value – green area).

Ultra dB system – fire protection

The proper, practical and economic solution, offering fire protection for the system are fire protection collars. The new generation fire protection collars are characterized by small dimensions and were developed for safeguarding of plastic pipeline culverts in walls and ceilings (Fig. No. 8).

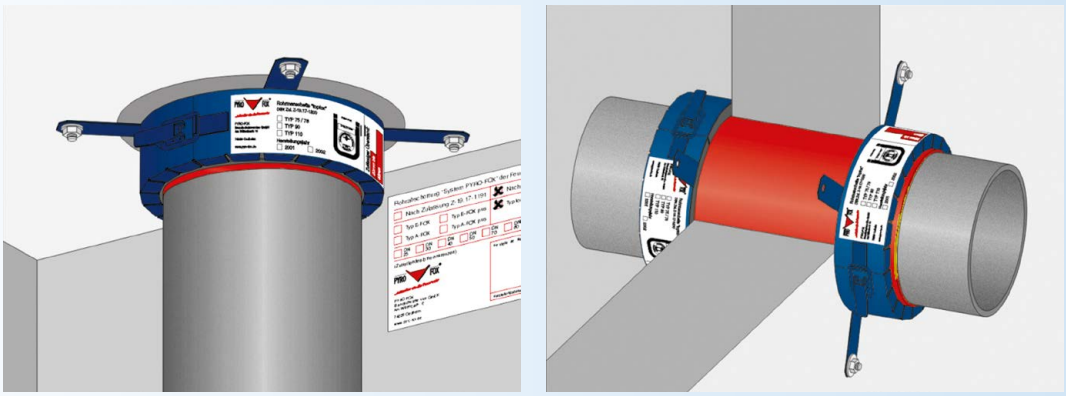


Fig. No. 8 a) Ceiling culverts b) Wall culvert

They have to be fixed with bolts to the wall or ceiling. The clamp closing allows assembly after pipe installation. For wall culverts two fireproof collars have to be used. In case of mounting in light walls use threaded bolts, and the collars turn by 45° against each other.

Certificates

The Ultra dB system has been approved for trade marketing on the grounds of the following standards and approvals:
Technical Approval No. AT-15-9406/2014 issued by the Polish Building Research Institute, standards:
PN-EN 14758-1 and PN-EN 1451-1:2001, Hygienic Conformity Certificate issued by the National Institute of Public Health.

Instytut Techniki Budowlanej
00-611 WARSZAWA | ul. FILTROWA 1 | tel.: (48 22) 825 04 71, (48 22) 825 76 55 | fax: (48 22) 825 52 86
Członek Europejskiej Unii Akceptacji Technicznej w Budownictwie – UEAtc
Członek Europejskiej Organizacji ds. Aprobat Technicznych – EOTA

Seria: APROBATY TECHNICZNE

APROBATA TECHNICZNA ITB
AT-15-9406/2014

Na podstawie rozporządzenia Ministra Infrastruktury z dnia 8 listopada 2004 r. w sprawie aprobat technicznych oraz jednostek organizacyjnych upoważnionych do ich wydawania (tekst jednolity: Dz. U. z 2014 r., poz. 1040), w wyniku postępowania aprobacyjnego dokonanego w Instytucie Techniki Budowlanej w Warszawie, na wniosek firmy:

Magnaplast Sp. z o.o.
Sieniawa Żarska 69, 68-213 Lipinki Łużyckie

stwierdza się przydatność do stosowania w budownictwie wyrobów pod nazwą:

Rury i kształtki systemu Ultra dB z polipropylenu do kanalizacji wewnętrznej niskoszumowej

w zakresie i na zasadach określonych w Załączniku, który stanowi integralną część niniejszej Aprobaty Technicznej ITB.

Termin ważności:
17 listopada 2019 r.

Zastępca Dyrektora
ds. Współpracy z Gospodarką
Marek Kaproń

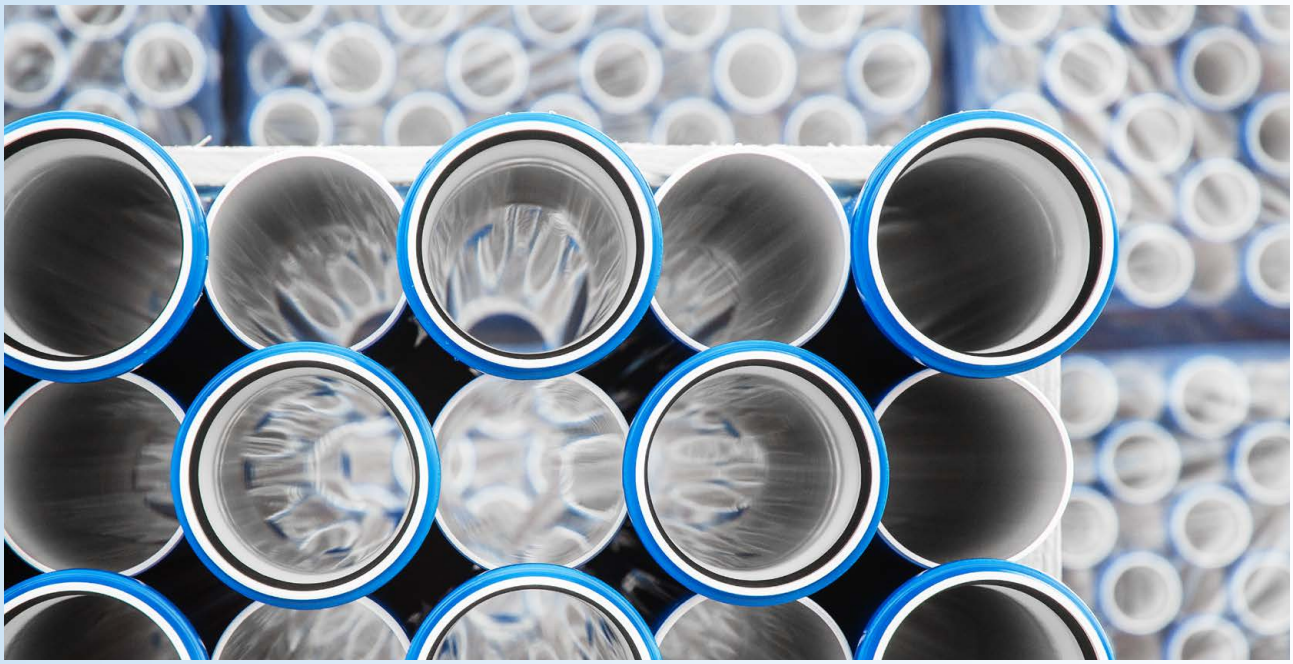
Załącznik:
Postanowienia ogólne i techniczne

Warszawa, 17 listopada 2014 r.

Dokument Aprobaty Technicznej ITB AT-15-9406/2014 zawiera 17 stron. Tekst tego dokumentu można kopiować tylko w całości. Publikowanie lub upowszechnianie w każdej innej formie fragmentów tekstu Aprobaty Technicznej wymaga pisemnego uzgodnienia z Instytutem Techniki Budowlanej.

Quality warranty for the Ultra dB system

- Renowned raw material suppliers
- Superior quality seals
- Continuous raw material and manufacturing process control
- Own laboratory



Specification of standards:

1) **PN-EN 12056-1** Gravity Drainage Systems Inside Buildings. Part 1: General and Performance Requirements.

2) **PN-EN 12056-2** Gravity Drainage Systems Inside Buildings. Part 2. Sanitary Pipework, Layout And Calculation.

3) **PN-EN 12056-3** Gravity Drainage Systems Inside Buildings. Part 3: Roof Drainage, Layout And Calculation.

4) **PN-EN 12056-4** Gravity Drainage Systems Inside Buildings. Part 4: Wastewater Lifting Plants - Layout And Calculation.

5) **PN-EN 12056-5** Gravity Drainage Systems Inside Buildings. Part 5: Assembly and Inspection, Operations, User and Operating Instructions.

6) **PN-EN 1053:1998** Plastics Piping Systems - Thermoplastics Piping Systems For Non-pressure Applications - Test Method For Watertightness.

7) **PN-ENV 1451-1:2001** Plastics Piping Systems For Soil And Waste Discharge (Low And High Temperature) Within The Building Structure - Polypropylene (pp) - Part 1: Specifications For Pipes, Fittings And The System.

8) **PN-EN 1610:2002** Construction And Testing Of Drains And Sewers.

9) **PN-ENV 1046: 2007** Plastics Piping And Ducting Systems - Systems Outside Building Structures For The Conveyance Of Water Or Sewage - Practices For Installation Above And Below Ground. Systems Outside Building Structures For The Conveyance Of Water Or Sewage. Practices For Installation Above And Below Ground.

10) **PN-ENV 13801:2009** Plastics Piping Systems For Soil And Waste Discharge (low And High Temperature) Within The Building Structure - Thermoplastics - Recommended Practice For Installation.

11) **PN 87/B-02151/02** Building Acoustics. Noise Protection Of Apartments In Buildings.

12) **DIN 4109** Noise Protection in High-Rise Buildings.

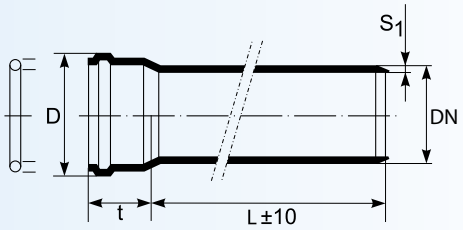
13) **PN-EN 14366 : 2006** Laboratory Measurement Of Noise From Waste Water Installations.

14) **PN-EN 14758-1,** Plastics Piping Systems For Non-Pressure Underground Drainage And Sewerage. Polypropylene With Mineral Modifiers (Pp-Md).

15) **VDI 4100** - Noise Control In Apartments - Guidelines.

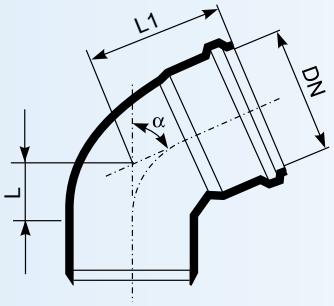
Socket pipes (UdBEM)

DN [mm]	s1 [mm]	D [mm]	t [mm]	L [mm]	Item No.
50	2,0	64	56	250	146010
50	2,0	64	56	500	146020
50	2,0	64	56	1000	146040
50	2,0	64	56	2000	146060
75	2,3	89	61	250	146110
75	2,3	89	61	500	146120
75	2,3	89	61	1000	146140
75	2,3	89	61	2000	146160
110	3,4	128	72	250	146210
110	3,4	128	72	500	146220
110	3,4	128	72	1000	146240
110	3,4	128	72	2000	146260

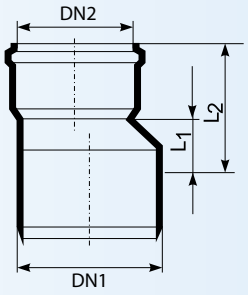


Bends (UdBB)

DN [mm]	angle α	L [mm]	L1 [mm]	Item No.
50	15°	10	70	146300
50	30°	9	68	146310
50	45°	17	77	146320
50	87°	28	84	146330
75	15°	23	91	146340
75	30°	11	80	146350
75	45°	18	92	146360
75	87°	42	94	146370
110	15°	9	15	146420
110	30°	17	21	146430
110	45°	26	29	146440
110	87°	59	65	146450

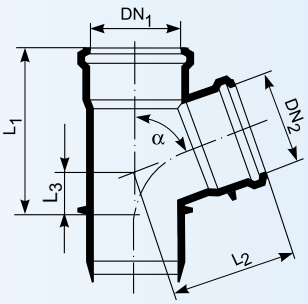


Reducers (UdBR)



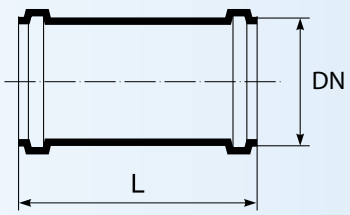
DN1/DN2 [mm]	L1 [mm]	L2 [mm]	Item No.
75/50	19	73	146600
110/50	37	93	146610
110/75	22	87	146620

Branches (UdBEA)



DN1/DN2 [mm]	α angle	L1 [mm]	L2 [mm]	L3 [mm]	Item No.
50/50	45	133	116	12	146560
75/50	45	147	145	1	146540
75/75	45	183	159	18	146520
110/50	45	150	158	17	146500
110/75	45	186	186	50	146480
110/110	45	134	134	26	146460
50/50	87	117	91	28	146570
75/50	87	119	99	27	146550
75/75	87	158	115	40	146530
110/50	87	150	125	23	146510
110/75	87	186	126	36	146490
110/110	87	64	62	59	146470

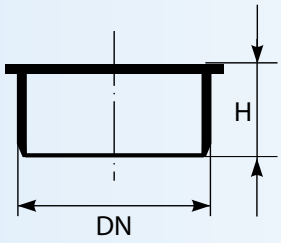
Sliding muffs (UdBU)



DN [mm]	L [mm]	Item No.
50	103	146650
75	109	146660
110	136	146670

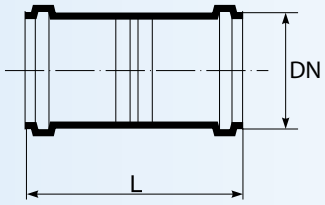
Plugs (UdBM)

DN [mm]	H [mm]	Item No.
50	39	146710
75	39	146720
110	46	146730



Double sockets (UdBMM)

DN [mm]	L [mm]	Item No.
50	112	146680
75	118	146690
110	136	146700



Access pipe (UdBRE)

DN [mm]	L [mm]	Item No.
110	308	146750

Notes

magnaplast

HTplus indoor sewage system

Ultra dB low-noise indoor sewage system

Skolan-dB thick-walled, low-noise sewage system

KG PVC outdoor sewerage system

PP outdoor sewerage system Magnacor

PP KG 2000 outdoor sewerage system

Sewerage chambers system

Polyethylene (PE) pressure pipes

Drainage (DR) systems

SIENIAWA ŻARSKA 69, 68-213 LIPINKI ŁUŻYCKIE
POLAND

TEL.: +48 68 363 27 00,
FAX: +48 68 363 27 72,
magnaplast@magnaplast.com.pl
www.magnaplast.pl